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**Improvement of coffee production in
Africa by the control of coffee wilt disease
(tracheomycosis)**

Summary of the final report

Background

1. This document contains a summary of the final report of the project entitled 'Improvement of coffee production in Africa by the control of coffee wilt disease (tracheomycosis)' which was submitted by the Project Executing Agency, CAB International.
2. The project commenced in October 2000 and ended in December 2007. The participating countries were Cameroon, the Democratic Republic of Congo, Côte d'Ivoire, Ethiopia, Rwanda, Tanzania and Uganda.
3. A copy of the full report is available on request from the Secretariat.

Action

The Council is requested to note this document.

IMPROVEMENT OF COFFEE PRODUCTION IN AFRICA BY THE CONTROL OF COFFEE WILT DISEASE (TRACHEOMYCOSIS)

Summary of the final report

Project background



Tracheomyces or vascular wilt disease of coffee or coffee wilt disease (CWD) is caused by a fungus (*Fusarium xylarioides*) which also has a sexual stage (*Gibberella xylarioides*). The pathogen was first described in the Democratic Republic of Congo in 1948, although the disease had already been identified for two decades. During the 1940s and 1950s, the disease became a serious problem for Robusta coffee (Fraselle, J. 1950) in several countries in West and Central Africa, but the disease was controlled through use of resistant varieties, and uprooting and burning infected coffee trees, which reduced its impact to that of a minor disease. Coffee Arabica, *C. canephora*, *C. excelsa* and wild coffee species are all susceptible, although there are two distinct strains of the same disease, one infecting Robusta, and another infecting

Arabica coffees. In the early 1980s the disease was reported to be causing considerable losses to Robusta coffee in the North Eastern Democratic Republic of Congo (D.R. Congo) and Uganda. This marked the resurgence of the disease. The full extent of losses due to this disease was not quantified precisely but its presence was confirmed in 12 of the 27 coffee growing districts in Uganda before the project began. However, substantial losses of between 60-90% due to the disease were observed in the North Eastern D.R. Congo by Dr Julie Flood.

The gravity of the disease was recognized by the InterAfrican Coffee Organisation (IACO) which recommended holding a workshop to draw up strategies for containing the disease and formulate a project for funding by the international community. In February 1997, a meeting of representatives of the International Coffee Organization (ICO), CABI and CIRAD agreed that a regional workshop should be held in Uganda from 28 – 30 July 1997, coordinated by the Coffee Research Centre (COREC) of the National Agricultural Research Organization (NARO), Uganda.

The original concept, which was a single, large project with the ICO as the Supervisory Body, was subsequently revised to develop a fully integrated programme of activities addressing different facets of the disease and its management, to facilitate funding of discrete

activities, expedite work on the ground and make tenable financial arrangements. The revisions resulted in the establishment of a series of inter-related and interdependent projects, each dealing with specific components of the epidemiology and control of CWD, collectively referred to as the Regional Coffee Wilt Programme (RCWP). It took several years to progress from the initial proposal in 1998 to the launch of the RCWP in February 2001 in Nairobi, Kenya.

Major findings

Biological and socioeconomic surveys

Substantial information on environmental, physical and agronomic parameters affecting CWD severity and importance was gathered in the D.R. Congo, Ethiopia, Rwanda, Tanzania and Uganda through biological and socioeconomic surveys.

Epidemiology and variability of the coffee wilt disease pathogen

In-depth laboratory, glasshouse and field analysis of CWD pathogen, using wide ranging methods provided more information on the disease, for instance:

- Two genetically and biologically distinct forms of the fungus, *G. xylarioides*, are responsible for current disease outbreaks.
- Variants causing current epidemics are genetically and biologically different to variants found during earlier epidemics in West and Central Africa
- Research also clarified nature and mechanisms of pathogen transmission
- Confirmation that wounding trees with a machete previously used on diseased wood is sufficient to transfer the disease to healthy coffee

Development of long-term breeding strategy

- Resistant Robusta materials have been identified in the D.R. Congo and Uganda, and to some extent in Tanzania.
- Screening studies in the Democratic Republic of Congo reported that 35 coffee lines were already collected and established in two areas with CWD.

Dissemination and training of extensionists and farmers

Potential control measures from biological and socioeconomic surveys, farmers, extensionists, researchers and literature were agreed upon following participatory approaches in each country and were evaluated through a series of on-station and on-farm trials in the D.R. Congo, Ethiopia and Uganda. On-farm trials were also carried out in Tanzania.

Way forward

A range of outputs were generated by the Regional Coffee Wilt Programme, many of which are already being utilised by farmers. However, to prevent what happened in the 1950s and the 1980s when CWD was controlled and re-emerged some years later, there is a need for continued efforts in breeding varieties resistant to all major coffee diseases. In addition, the gains made by the programme in coming up with resistant varieties need to be consolidated by speeding-up propagation of resistant varieties so that they become available to farmers.

In Uganda, considerable progress has been made towards developing Robusta coffee varieties which are resistant to CWD. It is necessary to accelerate the propagation and distribution of these varieties to the Robusta coffee-growing countries in the region. This will require support for the countries in developing efficient coffee nursery/seed systems.

Other countries such as the D.R. Congo and Ethiopia have not progressed much in getting resistant varieties and need to be supported further in this aspect. Work is also needed in supporting countries bordering CWD affected countries to initiate pre-emptive breeding work and to strengthen their surveillance and quarantine capacities.

The activities carried out in Rwanda by the Regional Coffee Wilt Programme could also be carried out in countries which have not yet been infested but are at risk. The mechanisms for facilitating adoption of coffee technologies which have been initiated, and the outputs generated by the Regional Coffee Wilt Programme need to be extended to other countries which did not participate in the programme in order for them to be prepared.